

BETTER LIGHTING EFFECTS in the THEATRE

theatre lighting



MAJOR
EQUIPMENT CO. INC.

Chicago, Ill.



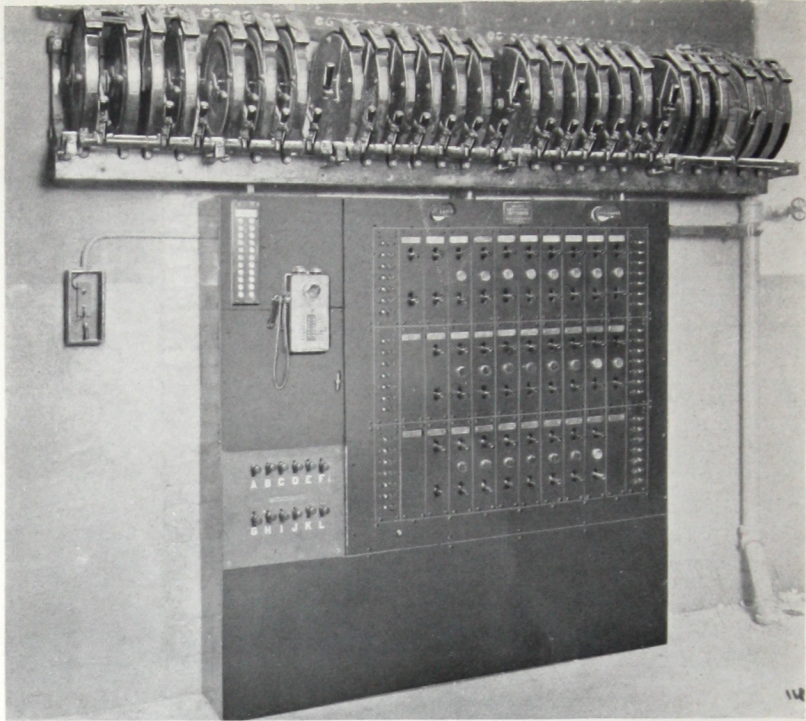


Fig. 1.—Major Pilot Board installed in the Peoples Theatre, Chicago.

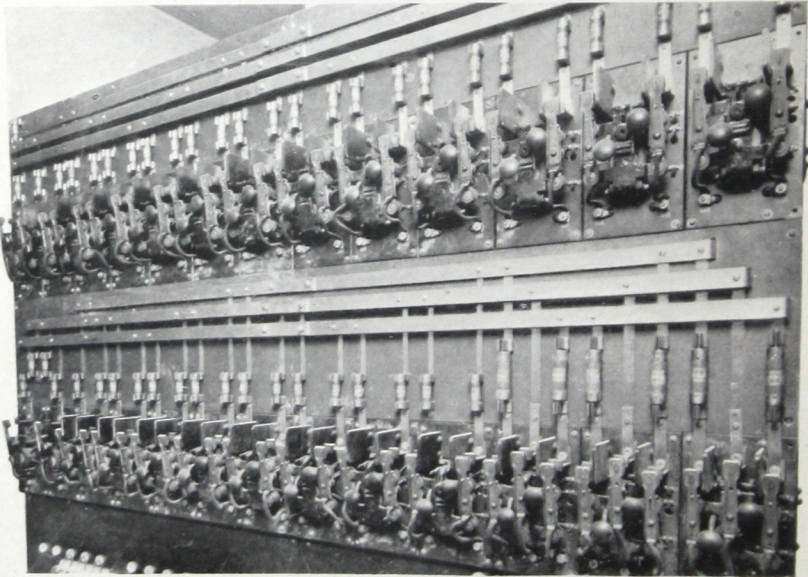


Fig. 2.—Magnetic Remote Control Switches used in connection with the Major Pilot Board shown above.

Better Theatre Lighting

As Provided Through the Application of Major Pre-Selection System of Remote Control.

Like many other important developments this system owes its peculiar merit to the simple idea of using pilot control with magnetic switches for making and breaking the circuits. Scarcely less important, however, to the success of the system is the fact that the pilot and remote switch elements used are the products of able designers intimately acquainted not only with theatre requirements but also with sound electrical construction. This booklet presents a description of the elements of the Major system, the following comments, however, being made in the belief that a knowledge of what this system does will help to a clearer understanding of this description.

In a small moving picture house or large hall, quiet, non-flashing operation and space economy, and occasionally control from one or more distant points, are of utmost importance. Two or three, or more, Major units comprising a small switchboard will give these features most admirably.

In the larger theatres and auditoriums the Major Pre-Selection System of Theatre Lighting gives proportionately greater advantages. The stage electrician, while a scene is running, can "set up" for a second and third scene, or for any desired combination of lights in advance. He can also make each change by means of a single lever easily responding to a finger touch and he can make these "sets-ups" and changes without delay, or physical effort or special agility. At the same time these "set-ups" do not interfere with whatever control of individual circuits may be required as a matter of emergency or for special purposes, such as "work lights" behind a drop during a dark change.

Some of these things can be done on ordinary open knife switch boards with double throw switches and two sets of busses;—some are possible on dead front mechanical switchboards provided with master busses. Remote control switchboards have been tried before, but with indifferent success—but it has not been possible to do all of these things—nor to do most of them so simply and surely—until the Major system was perfected.

The control board located on the stage saves space where space is most needed. The fact that the control board on the stage does not handle the heavy current of the lights themselves reduces fire hazard and avoids flashing in the dark scenes or dark changes.

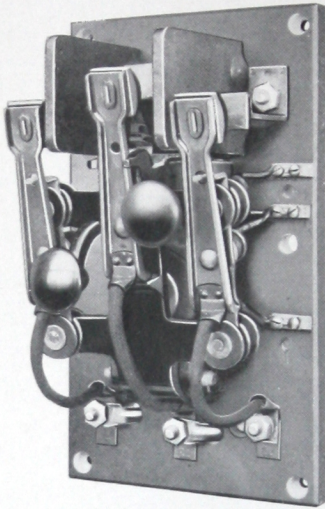


Fig. 3.—C-H Magnetic Remote Control Switch. The front is 12" x 7" and over-all depth only 4 $\frac{3}{8}$ ". No current is used except for operating.

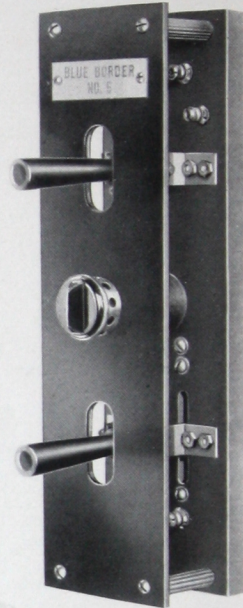


Fig. 4.—Major Pre-Selection Switch made up of two S. P. double throw, 60 amp switches, each having momentary contact and permanent or set-up position. Front is 4" x 14".

Pilot lights at the various control units show the operator at a glance what circuits are in use, and (when dimmers are used) they show him whether each circuit is dim or bright.

A most novel feature of the Major System provides for the operation of all or any desired circuits by the actor himself by means of a "practicable" switch on the scene wall. This often avoids the necessity of relaying a cue to the electrician. When the villian pushes the button the lights respond on the instant—instead of five long seconds later. Similarly, control may be had from orchestra pit, projecting room, or other parts of the theatre if required. These features, however, in no way interfere with the control of the lighting program by the stage electrician, who is at all times master of the situation.

"SAFETY FIRST."

The popular movement of late years for "safety first" features is especially felt in theatre installations. Municipal authorities and Safety Boards are coming to demand electrical equipment which will afford absolute protection to the operator and remove all fire hazard. As an indication of this tendency may be cited the common practice of requiring "dead front" theatre switchboards. These boards while they afford protection to the operator or stage hand from electrical shock really go little further to meet the safety first demands. The heavy cables are still carried to the stage and the arc is present though it is on the back of the board instead of in front.

The Major System meets the most rigid safety rules since only the pilot board is installed on the stage or at the operator's station. The small pilot switches which handle only coil circuits, and to which are attached the two No. 14 wires going to the remote switches, are so constructed that it is impossible to get near any live parts. The remote magnetic switches carrying the arc are mounted in some fire-proof room or enclosure located wherever convenient. Too much emphasis cannot be placed on the advantage of removing arcing switches from the stage. All of us have in witnessing a high class production been carried away by the art of the players and the beauty of a scene only to be rudely brought back by the noise or arc produced by the operation of a switch on the stage.

Because of higher standards and safety rules there is a growing demand for a high class electrical installation in connection with "legitimate" playhouses. In the same way, the improvement in the moving picture art and the demands for a high class presentation of wonderful productions call for the best electrical equipment. In fact, no small part of a picture program is the color lighting in connection with the overture or specialties. To secure these effects a comprehensive dimmer installation is needed, and in combination with these the Major System is absolutely necessary to insure the smooth spectacular effects desired.

DESCRIPTION OF MAJOR SYSTEM.

The main elements of the Major Pre-Selection System of Remote Control of Theatre Lighting are two:

1. A Pilot Control Board (see Fig. 1), usually located on the stage.
2. A Remote Board (see Fig. 2), usually located below the stage or elsewhere, preferably near the center of distribution.

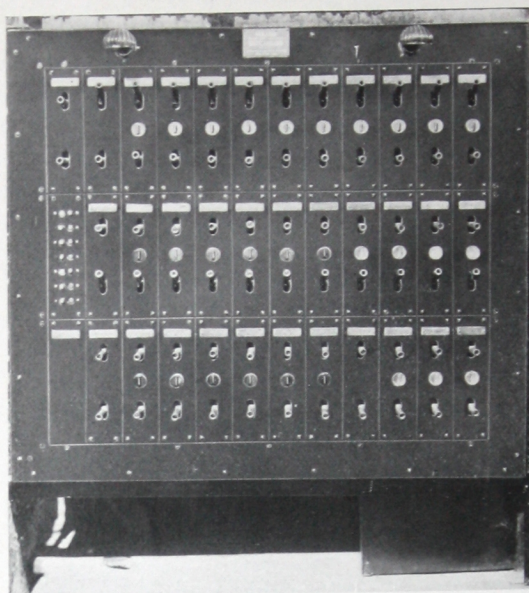


Fig. 5.—Major Pilot Board, Illinois Theatre, Chicago.

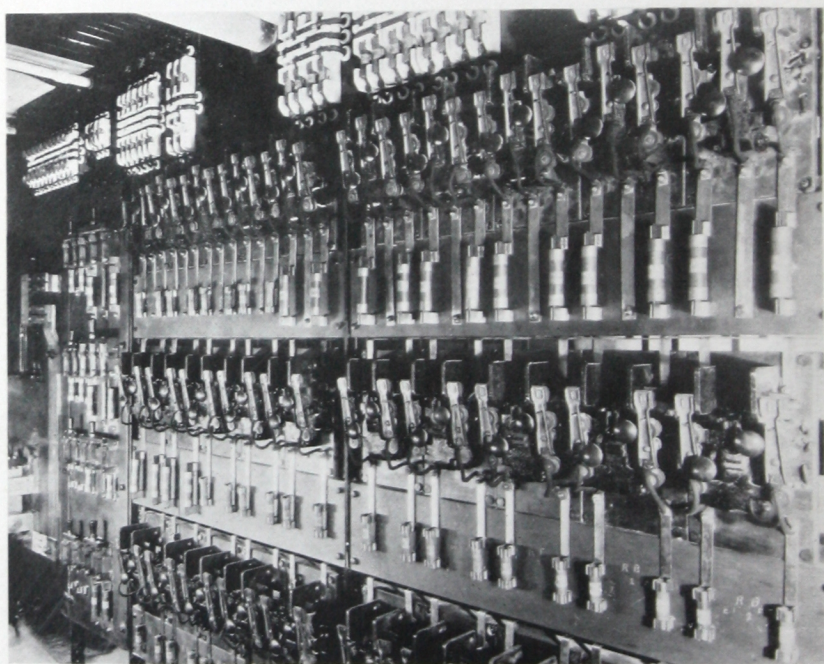


Fig. 6.—C-H Magnetic Switches used in connection with Major Pilot Board at the Illinois Theatre, Chicago.

THE PILOT CONTROL BOARD.

The Pilot Control Board is essentially an assembly of standard pilot switch units like the one shown in Fig. 4. These units are all of one size and capacity, 4 inches wide and 14 inches high, each having a composition base carrying two normally open single pole double throw knife switches, and the switch plate with colored bulls eye. When either of the two switch handles is pressed downward a momentary contact is made, and when released the handle returns to the neutral or open position. Upon pressing either switch handle upward the switch will remain in this "set-up" or permanent position. The "set-up" position does not establish an electrical connection, but simply provides a metallic path for the current when a main or color main switch is thrown into its down or momentary position.

Each handle has a Neutral, a Momentary Contact, and a Set-Up or Pre-Selective position. The upper handle of each unit is the "on" switch and is connected to one side of the closing coil terminal of the remote switch (see Fig. 3). The lower handle is the "off" switch and is connected to the opening coil of the remote switch. The upper handle will only turn lights "on," while the lower handle will only turn them "off." In other words, the handle that turns them "on" will not put them out and vice versa.

The pilot light is located between the two handles and is connected to one of the branch circuits fed by the remote switch which is controlled by the handle on either side of the light. The connections are all made on the front of the unit.

The moving parts of each switch consist of flat copper strips of ample proportions terminating in a handle projecting through the steel switch plate. The contacts are of the laminated wiping type of rugged construction.

THE REMOTE CONTROL BOARD.

The Remote Board (see Fig. 2) is essentially an assembly of C-H remote switch units one of which is shown in Fig. 3.

This switch which is manufactured by The Cutler-Hammer Mfg. Co. of Milwaukee, Wis., is made with either two or three poles and has a capacity of 100 amperes at 230 volts. It is open and closed by electro-magnets controlled by the corresponding pilot switch on the Major Pilot Board. When closed, the switch is mechanically held by a latch which is tripped when the opening coil is energized. Therefore, no current is used except in the closing and opening operation, thus making its use economical.

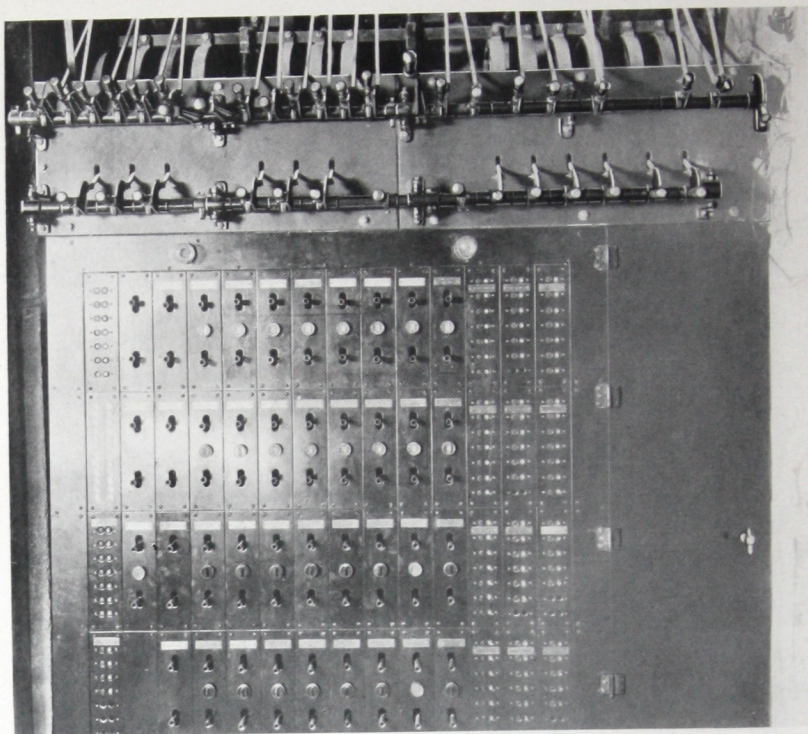


Fig. 7.—Dimmer and Major Pilot Board, Palace Theatre, Cincinnati.

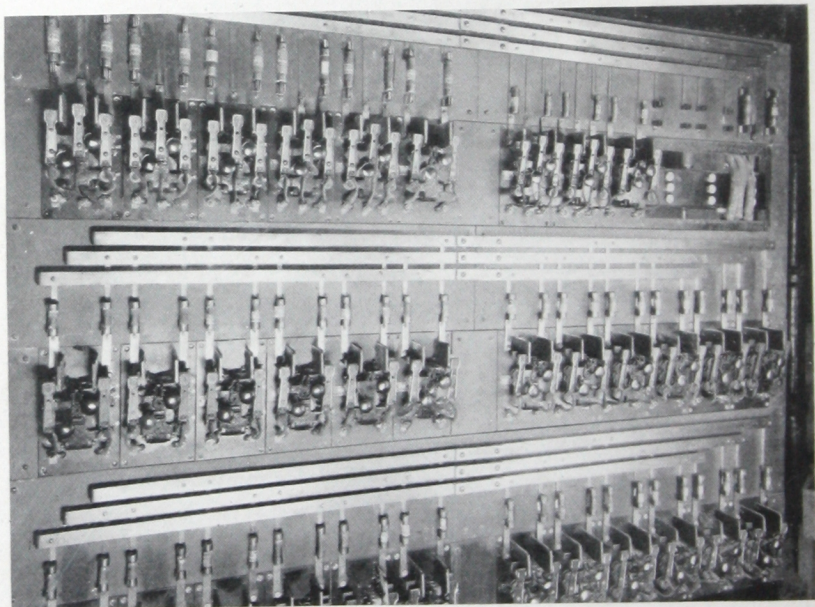


Fig. 8.—Magnetic Remote Control Switches, Palace Theatre, Cincinnati.

The operating mechanism, arc shields, and terminal lugs are mounted on a slate of standardized size, 12 inches by 7 inches by $\frac{3}{4}$ inch, which has four mounting holes. The total depth of the switch including the base is $4\frac{5}{8}$ inches. The cold rolled copper tipped contact fingers are of the wiping type, easily inspected and renewed. Moulded arc shields between poles prevent arcing across. Two large buttons of moulded insulation are mounted on the operating mechanism of the switch for manual control. One serves to close the switch and the other to release the latch and open it.

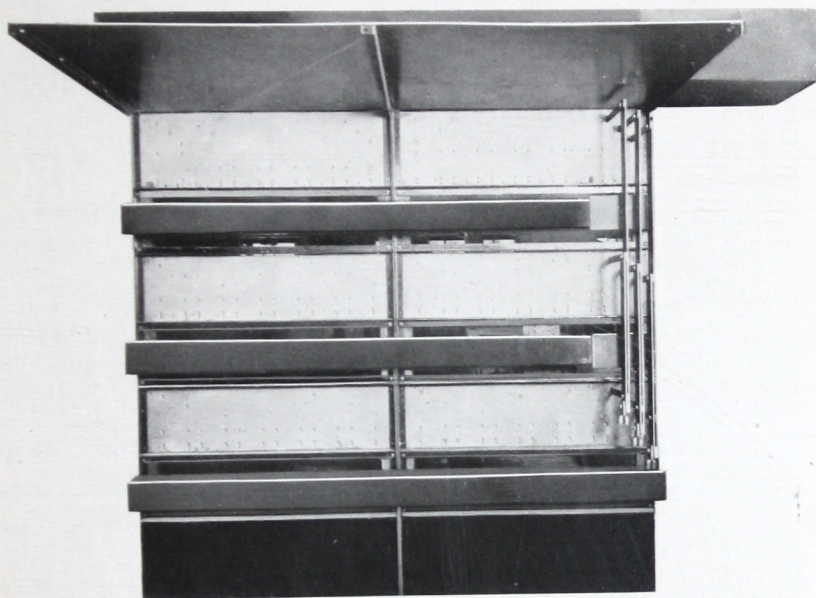


Fig. 9.—Rear View Major Pilot Switchboard, Palace Theatre, Cincinnati.

OPERATION OF THE PILOT BOARD.

The operation of a Major Pilot Switchboard is very simple, and any stage electrician, after working at the board for half an hour, can readily make or "set up" any kind of a change. About the only thing one must bear in mind while operating this board is that the upper handle is the "on" handle and will only turn the lights "on," while the lower handle is the "off" handle and will only turn the lights "off" (see Fig. 4). Each handle has three positions, viz., Neutral, Momentary Contact, and "Set-Up" or Pre-Selective position.

When the handle is in the horizontal position it is in Neutral, when pressed downward it is in the Momentary position, and upward in the "Set-Up" or Pre-Selective position. The downward

movement of the upper handle of any individual unit closes the operating circuit of the closing coil on the corresponding remote switch only momentarily (that is, only while the handle is depressed), thus closing the remote switch, which when closed is mechanically latched. The closing of this remote switch supplies current to a number of branch circuits, one of which feeds the pilot lamp of the pilot switch unit, which when lighted shows that the remote switch is closed. When the handle is released, it auto-

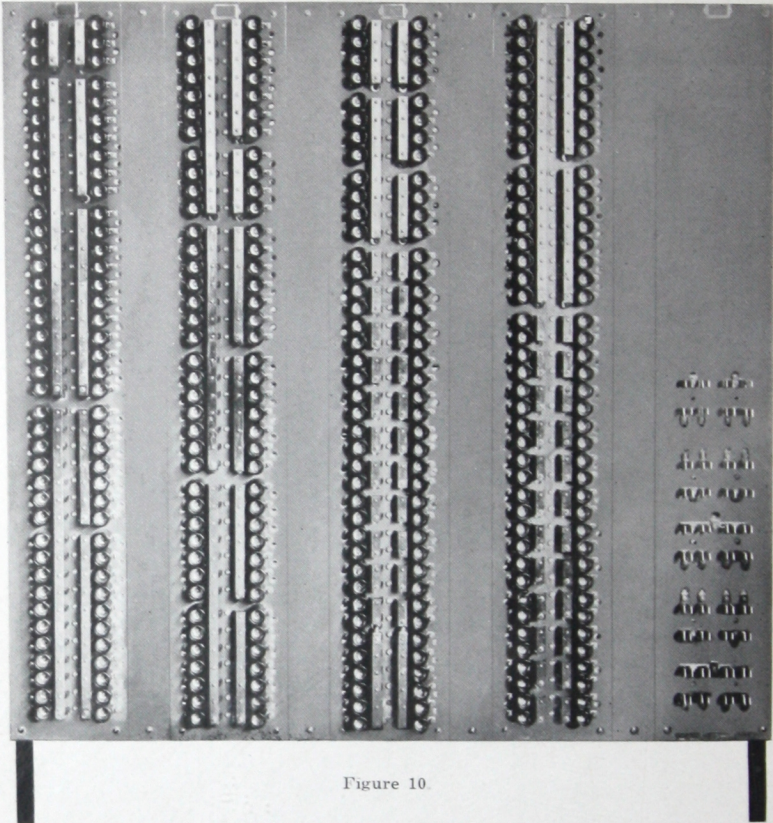


Figure 10

matically returns to the Neutral position, but the remote switch being mechanically latched remains closed. The downward movement of the lower handle of any individual unit closes the operating circuit of the opening coil on the corresponding remote switch only momentarily, thus opening the remote switch by tripping the mechanical latch. This operation opens the circuit to the branch fuses, and the lamp goes out showing the operator that the remote switch is open.

When the handle is released it returns to the Neutral position, and the remote switch remains open. Therefore, pressing the upper handle of any individual unit downward turns on the light, and pressing the lower handle of the same unit downward puts out the light.

The upward movement of either handle of any individual unit sets the switch in the "Set-Up" or Pre-Selective position so that it can be controlled by the color main. (The color main is a switch unit without pilot light or bulls eye which controls all the individual units of one color in the same horizontal row.) This "Set-Up" or Pre-Selective position produces no effect on the corresponding remote switch until the color main is thrown into its downward or Momentary position.

The upward movement of either handle of any color main unit sets the switch in the "Set-Up" or Pre-Selective position so that it can be controlled by the stage main. (The stage main is a switch without pilot light which controls all the color mains.) As previously explained, these color mains control all the individual switch units. The setting up of the color mains has no effect on the remote switches until the stage main is thrown into its downward or Momentary position.

The downward movement of the upper handle of any color main unit will cause all of the individual switch units in the same color row, which are in the "Set-Up" position, to receive current, thereby closing the corresponding remote switches. The downward movement of the lower handle of any color main will cause the individual color units in the same row which are "set up" to receive current, thus opening the corresponding remote switches. The downward movement of either handle of the stage main causes current to flow through the "Set-Up" position of all color mains and from the "Set-Up" position of these color mains through the "Set-Up" position of the individual color switches.

Any individual switch can be operated in three different and distinct ways. First, any switch can at all times be operated by pressing the handle into the downward position. Second, both the handles can be placed in the "Set-Up" position and the switch controlled by operating the color main handles in the downward position. Third, by leaving the individual switch in the "Set-Up" position and setting the color main handles in the "Set-Up" position the switch can be operated by moving the stage main handles in the downward position.



Fig. 11.—Major Switchboard at Municipal Tubercular Sanatorium, Chicago.

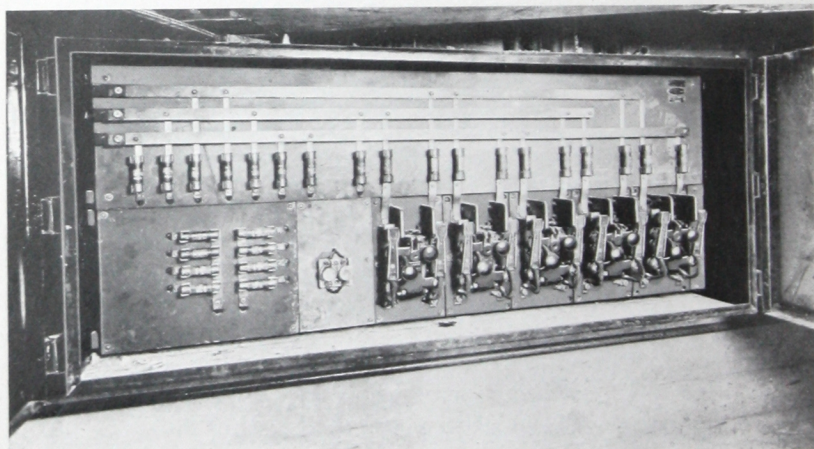


Fig. 12 —Location of Magnet Switches used in connection with Major Pilot Switchboard and C-H Theatre Dimmers at the Municipal Tubercular Sanatorium, Chicago.

HERE IS AN EXAMPLE OF OPERATION.

Let us try a simple lighting change on a Major Pilot Switchboard. For the first scene "we open" with white foots and white borders numbers 1 to 5. To get these we "set up" the upper handles of the above named individual switch units and throw the white main upper handle into the downward or momentary position which causes the corresponding remote switches to close and light the lights. The next cue is "all lights out," and we are to "come back" with white and red foots, red borders 2 and 4, and blue borders 3, 4 and 5. We are going to set this change up so that we can make the two changes by operating only two handles and not have to change the position of any handle while the lights are out.

The first thing we do to make a dark change is to glance at our pilot caps or bulls eyes and wherever one is lighted we set the corresponding lower or "off" switch in the "Set-Up" position. In this case we have the white foots and borders numbers 1 to 5 lighted, so we set the "off" handles of these units into the "Set-Up" position, and then the "off" handle of the white main in the "Set-Up" position. The whites are now all set to go out when the "off" or lower handle of the stage main is pressed downward or into its momentary position.

We will now proceed to set up our next change,—"come up" white and red foots, red borders 2 and 4, and blue borders 3, 4, and 5. First we set the "on" or upper handles of the above mentioned switch units into the "Set-Up" position, then return the upper handles of white borders 1 to 5 to the neutral position, and set the upper handles of the white, red and blue mains to the "Set-Up" position, which puts them all on the stage main control. It is understood that all handles not mentioned are in neutral. We are now set to make both our changes by simply pressing first the lower and then upper handles of the stage main. Pressing the lower handle puts out all the whites, and pressing the upper handle puts on the white and red foots, red borders 2 and 4, and blue borders 3, 4 and 5. Many changes can be made on this board that are impossible to make on any other kind of a switchboard. For example, we may have a scene where we are using all our foots, borders, and pockets in three or more colors and we want to "go dark" leaving only the the gallery arcs on and come right back with red foots, red border No. 1, and white border No. 5 for "working light" behind a drop. These changes can be made without touching the board while the lights are out, by operating only the two handles on the stage main.

First, set the "off" handles of all the color mains and of all units except the gallery arcs in the "Set-Up" position; next, set the "on" handles of the red foots, and red border No. 1, and white border No. 5 in the "Set-Up" position. Then set the "on" handles of the white and red main into the "Set-Up" position. We are now ready for both changes, and by pressing the "off" handle of the stage main all lights except the gallery arcs will go out, and when we press the upper handle of the stage main the red foots and red border 1 and white border 5 will "come on." One should bear in mind that any individual switch unit on the entire board can be operated either "on" or "off" regardless of any "Set-Up" position of the mains or other switches.

CONTROL FROM ANY PART OF HOUSE.

Another feature of the board is the possibility of controlling any individual switch unit or combination of groups of switch units or the entire board from any part of the stage, orchestra pit, or in fact, any part of the entire building. This is accomplished by running a three wire No. 14 stage cable with a two button momentary contact flush push switch to the point the board is to be controlled from.

CO-ORDINATING THE EFFECTS.

We have witnessed a stage performance at sometime where the butler walks through the "center door" and presses the flush push switch in the wall of the scene, and this switch lights the brackets and chandeliers on the scene. The electrician is supposed to throw on his foots and borders at the instant. Once out of every one thousand times he is right with the actor. The other 999 times he is anywhere from $\frac{1}{2}$ second to 5 minutes ahead or behind the actor's operation. The electrician should not be blamed, for he very seldom is where he can see the actor, and he must anticipate the cue or depend upon some one to stand where he can see the actor and relay the cue by waving a hand or signalling in some other way.

With the Major Pilot Board this situation is eliminated and the electrician's troubles are over. He runs a three conductor No. 14 stage cable to the wall of the scene and attaches a two button momentary contact flush push switch to the scene in place of the regular flush push switch. He then plugs his brackets and anything else he wants to control into the stage pockets, and sets the pocket switch unit, foots and border switch units into the "on" and "off" position, depending on whether the lights are to be

turned "on" or "off" or both. The electrician is now through and need not worry about missing his cue, for the actor controls the lights through the flush push switch. When the actor presses the white button of the push switch all the lights that are "Set Up" will go on, and when he presses the black button they all go out.

Any combination can be set up and controlled from any point in a like manner. It does not interfere with the operation of the board proper from the board itself, and the electrician at all times has control of the switchboard. The house lights can also be controlled from any number of stations located about the auditorium and in the projection room. This is a safety first feature, for if several of these switches are installed in the auditorium where they are in reach of the chief usher and doorman, and one in the projection room, in case of a fire, panic or accident of any kind, the auditorium lights can be turned on from any one of these stations regardless of the position of the house main or the whereabouts of the electrician.

TO SUMMARIZE.

The Major Pre-Selection System of Remote Control Theatre Lighting is:—

Complete—a fully developed control system for theatrical lighting. Any desired combination of effects can be produced, or any lighting change can be made by the operation of only 2 handles.

Flexible—being adaptable to the smallest picture show or lodge hall, as well as to the largest "legitimate" house—being suited to the exacting scenic effect or to the most elaborate auditorium lighting.

Revolutionary—simplifying the control of theatre lighting just as years ago the typewriter simplified the writing of letters—involving an idea never before used on manual or remote control stage switchboards.

Safe—surpassing any other system in reduction of fire and personal injury hazard.

Standardized—made up of unit elements "as like as a row of pins."

Economical—occupying a minimum of stage floor space—reducing installation and maintenance expense.

The outstanding features of the Major System are:

- Pre-determination and Pre-selection of Set-Ups.
- Simplicity.
- Safety—Dead Front.
- Compactness.
- Speed.
- Elimination of Heavy Feeders from stage.

This is the system that has been acclaimed by theatre authorities as representing the highest development offered for producing the lighting effects and giving the service required by present-day theatres.

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DETAILED DESCRIPTION OF SEVERAL INSTALLATIONS.

The following pages contain detailed description of several installations of Major Boards and Control. The small space required on the stage will be noted and since space is always at a premium here, this is a very important advantage. For the small institution, the safety feature is desirable because of the fact that they are often times operated by inexperienced men.

ILLINOIS THEATRE, CHICAGO.

Fig. 5 is a front view of the Major Pilot Switchboard installed in the Illinois Theatre, Chicago, Illinois. This board is on a level with the stage, and is set flush into the proscenium wall, with the dimmers mounted above the board. It is 56 inches wide, 48 inches high, and 10 inches deep, and replaces a live front board, 11 feet in length, 6 feet 6 inches in height, mounted 10 feet above the stage level on a platform which projected 6 feet beyond the proscenium wall.

This pilot board is made up of 34 Major pilot switch units as shown on page 4, mounted on an angle iron frame, and enclosed in a box or tub made of 10 gauge steel. The switch plates, which are a part of each switch unit, form the front of the board, and only the operating handles and pilot light caps project through the plates. The plates are not fastened to the switches, but are carried on a separate angle iron frame which is fastened to the 4 inch mat. The mat forms a trim for the board, and, also serves to enclose the 4 inch wiring gutter, which is provided on all sides of the board. Two sockets are mounted in the upper part of this mat for lighting the board. All switch plates and mats have a baked black finish. By removing four screws the switch or switch plate can be taken from the board without disturbing the remaining switches. The switch terminals are on the front of each unit directly behind the plate, so when the plate is removed all connections are in plain view. A 6-inch wiring space is left behind the switches.

The board is arranged for three color control;—white, red, and blue. The white control switches are in the upper row; the red, in the center; and the blue, below. The color cap located between the handles of each individual switch unit corresponds with the color of the lamps which the unit controls. Each cap is illuminated by a 15 watt type E Mazda candelabra base lamp, which is connected to one of the branch circuits controlled, but has no connection to the pilot switch or remote switch. This pilot lamp at all times shows the exact condition of the circuit—whether it is alive or dead, or to what extent it is being dimmed or brightened. Therefore, the stage electrician knows by a glance at his board just what circuits are "on," and whether they are "on the dimmer" or not. The first switch unit in the upper left hand corner is the stage main. Its position is optional as the unit can be moved to any

location on the board by simply moving the switch plate and three No. 14 wires to the new location. The next switch unit to the right is the white main, which controls all the individual switches in the upper or white row. The adjoining switch units in this row reading from left to right are as follows: white foots, white borders, numbers 1 to 5 inclusive, incandescent stage pockets, arc pockets O.P. down stage, arc pockets P. down stage, and bridge arc pockets.

Directly under the white main unit in the middle or red row is the red main unit, and adjoining this reading from left to right are the red foots, red borders, numbers 1 to 5 inclusive, fly floor arcs, arc pockets O.P. up stage, arc pockets P. up stage, and gallery arcs.

In the lower row is the blue main unit, and adjoining this reading from left to right are the blue foots, blue borders, numbers 1 to 5 inclusive, house main, main chandelier, balcony, and gallery rails, and main floor and balcony brackets. The switch plate to the left of the red main has seven flush switches for single circuits, as follows: Pilot lights in mat of pilot boards, orchestra lights, fly floor, rigging loft, lights under paint bridge and stage door light.

The plate to the left of the blue main is blank and covers a space where a switch can be added for future use.

The individual switch units are all alike in every respect, the plates varying only as to the pilot lamp color cap. The main units and color main units have no color caps, as a main unit operates a group of individual units and each individual switch unit has its own pilot lamp.

Remote Control Board Placed In Dressing Room.

The remote board (see Fig. 6) is controlled by the Major Pilot Switchboard shown in Fig. 5. The location of this board is optional, depending on existing conditions. It, however, should be installed near the service entrance or near the center of distribution and should be enclosed in a fire-proof room containing no other equipment. In this particular installation a dressing room was used. It was necessary only to remove all wood work and other equipment, leaving only the four hollow tile walls, plastered outside and inside. The wood door was replaced by a metal door equipped with a door check.

The service was brought in underground and consisted of three 1,500,000 circular mils lead covered cables. The service cables in this case were furnished by the power company, as the room was so situated that the cables were carried underground down an alley to a point opposite, and then through the wall of the building and attached directly to the service switch. This 2,500 amp. service switch and meter are shown on the panel at the extreme left of the board. The center panel is equipped with two and three pole N.E.C. fused knife switches for all motors and for exterior lighting of the building.

To the right of this panel is an angle iron frame structure carrying three rows of Major Special Remote Switches (Fig. 3). Below the remote switches are the fuse panels carrying 60 and 100 amp. Economy Fuses. All bus-bar work and terminal busses are on the rear of the board. All the control wires and feeders for the branch circuits run through a screw cover pull box, which rests on top of the board and extends its full length. The feeders terminate at the branch fuse blocks, some of which are shown mounted on the front of the pull box. The control wires between the pilot and remote switches are also carried in this box and up through a trough to the pilot board on the stage. There are only two No. 14 wires required between each pilot switch and each remote switch.

KEITH'S NEW PALACE THEATRE IN CINCINNATI USES MAJOR CONTROL.

The Major Pilot Switchboard in the Palace Theatre, Cincinnati, Ohio (see Fig. 7) is similar to those in Figs. 1 and 5, but is larger, being 64 inches wide, 64 inches high and 10 inches deep. A 3 foot recess in the proscenium wall allows a clear space of 24 inches behind the board after it is set flush with the front of the wall. The board is arranged for four color control having a flush push switch for each branch circuit in the auditorium. The rear of the Pilot board is made up of five bus bar fuse panels separated by four removable connecting strips, as shown in Fig. 10. Every fuse for the entire stage and auditorium is located on these panels, which carry 168 plug fuse circuits and 20 N.E.C. fuse circuits. Each circuit has a fiber marker indicating the location of

the lights. The space behind the pilot board is accessible through a steel door shown at the right of the board.

The Major Remote Control Board (see Fig. 8) is installed in a room in the basement directly under the pilot board. Fig. 9 is a rear view of the board set up in the shop, before any remote switches were installed, and before the conduit nipples, connecting the three horizontal wiring troughs with the pull box above the board, were put in place. This board is accessible from all sides, being set out from the wall 3 feet. The only exposed wires are the few inches of the six 500,000 circular mils feeders between the conduit on the end of the underground service conduit and the twin lugs at the bottom of the vertical busses which feed the horizontal busses on the front of the board.

MAJOR CONTROL IN THE PEOPLES THEATER.

Fig. 1 is a front view of the Major Pilot Switchboard as installed on the stage of the Peoples Theatre, Chicago, Ill.

The board in this case is also 56 inches by 48 inches by 10 inches deep, but instead of setting flush in the proscenium wall, it projects 10 inches onto the stage. The space to the left of the board supports the push buttons for dressing room calls, house telephone, and program-sign switches and is not a part of the Major Pilot switchboard but was built flush with the latter for the sake of appearance.

This board is made up of 27 Major Pilot Switch units (Fig. 4). Three blank plates allow the addition of switches in the future. The six switch plates arranged along both sides carry seven flush push switches each. The three plates on the right carry the 21 push switches which control the branch circuits for the auditorium cove lighting. These circuits are also controlled by a pilot switch and a remote switch. The 21 push switches on the left are for the work lights in the border, dressing room, orchestra pit, fly floor, rigging loft, boiler room, etc. The arrangement of the pilot switches on this board is very similar to that shown in Fig. 5. The construction features are the same on all boards.

Fig. 2 is a front view of the Remote Board, which is controlled by the Major Pilot Board shown in Fig. 1, and is installed in a room behind one of the stage boxes on the stage level. This board is 90 inches long, 84 inches high and 12 inches deep. It is entirely front connected, and varies from the one shown in Fig. 6 inasmuch as all the bus bar work is on the front of the board, except three vertical busses for connecting the horizontal busses and for attaching main feeders. Fig. 9 is a rear view of a similar board.

The fuse panels and remote switches are attached to an angle iron frame structure drilled and tapped for receiving them. Strips of removable copper connect the switch terminals with the lower end of the fuse terminals. Any switch can be removed from the rack, by removing the copper strips and taking out 4 screws. The bases of these remote switches are all the same size regardless of the number of poles, and are all of 100 amps. capacity, so that they are interchangeable.


CHICAGO MUNICIPAL TUBERCULAR SANITARIUM.

Fig. 11 is a front view of the Major Pilot Switchboard installed on the proscenium wall of the stage of the Chicago Municipal Tubercular Sanitarium, Chicago, Ill.

This board is 48 inches wide, 22 inches high and 10 inches deep. The fuse cabinet, which forms the upper part of the board, contains all the branch fuses for the entire building. Although a small installation, it shows how well this system can be applied to small theatres, churches, lodges, halls, clubs, or assembly halls in public schools. The system is ideal for installations of this class, which after being completed are often operated by some one inexperienced in the operation of a stage switchboard, and usually receive very little if any attention. The board is of the dead front safety first type, easily operated, speedy, reliable, flexible, preselective and absolutely fool-proof. First cost is low and maintenance expenses are reduced to a minimum.

The Major Remote Control Board installed in this sanitarium, is shown in Fig. 12. The entire board, consisting of fuse panels and remote switches, is enclosed in a steel cabinet, 50 inches by 28 inches by 12 inches deep, which is mounted on the proscenium wall in the basement under the stage near the service entrance.





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Besides the Major Pre-Selection System of Remote Control other Major products for the theatre are listed below.

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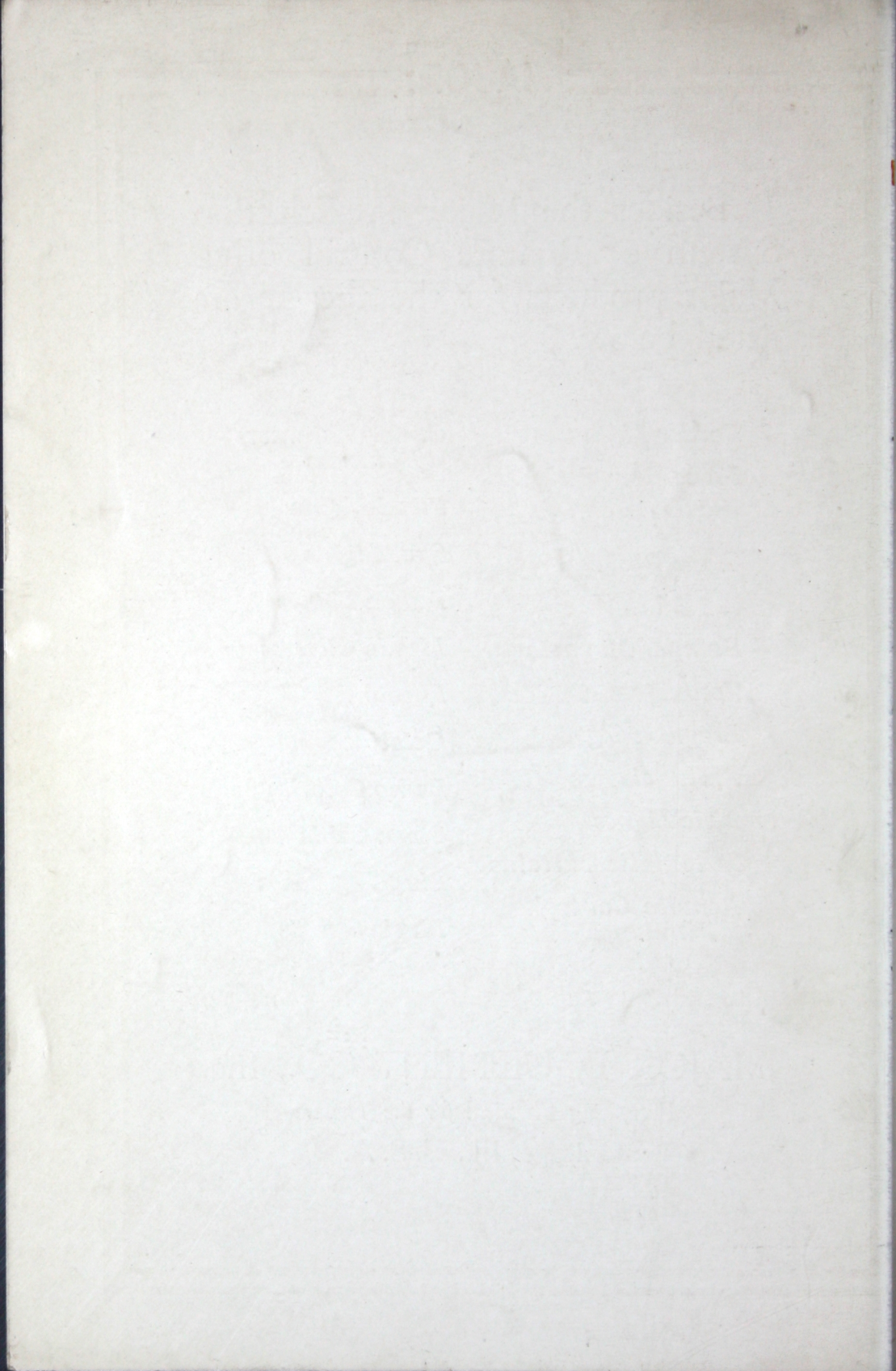
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